12-32-0000
32 PORT INPUT
EXPANSION MODULE

USER'S MANUAL

SEA AIR & LAND COMMUNICATIONS LTD, 120 St Asaph Street, Christchurch, New Zealand

12-32-0000 32 INPUT EXPANSION MODULE

1 DESCRIPTION

The 12-32-0000 is a 32 input expansion module that may be used either autonomously with a serial to ethernet converter or with any transmitter that supports Salcom protocol. Input modules may be daisy chained together to provide as many inputs as required.

A simple LCD provides indication of current inputs states and system messages. LEDs provide indication of system health, upstream and downstream serial port activity. When a message is generated by an input module the content of the message will display (up to the first 16 characters) on the LCD momentarily.

The 12-32 supports multiple message queuing, and will queue at least 50 messages. Pre-defined input messages are limited to a maximum length of 40 characters which may be configured using Salcom programming software.

The input module may be configured to tag each message with a source description (e.g [01] or [Shed 1]).

2 WARRANTY

Our products are warranted for a period of 12 months from date of purchase against faulty materials and workmanship. Should any fault occur the unit should be returned to the vendor, freight pre-paid. Please include a description of the fault to assist with prompt return. Any unauthorized alterations or repairs will invalidate the warranty.

3 DISCLAIMER

Information provided in this document is carefully prepared and offered in good faith as a guide in the installation and use of the 12-32. Installers must ensure that the final installation operates satisfactorily within the relevant regulatory requirements. We accept no responsibility for incorrect installation. We reserve the right to change products, specifications, and installation data at any time, without notice.

12-32-0000 32 PORT INPUT EXPANSION MODULE USER'S MANUAL Issue 1232UB 1008

4 INSTALLATION

The power supply is connected via P1, green power connector to +13.8 Volts and Ground. The supply input is protected against reversed connection.

S1 (Upstream) Connections:	
Pin 1	Ground
Pin 2	Not used
Pin 3	Not used
Pin 4	Not used
Pin 5	RS232 Tx
Pin 6	RS232 Rx

S2 (Downstream) Connections	
Pin 1	Ground
Pin 2	Not used
Pin 3	Not used
Pin 4	Not used
Pin 5	RS232 Rx
Pin 6	RS232 Tx

5 PANEL INDICATORS

There are 6 indicators on the top panel consisting of:

(1) **Power Indicator:** The GREEN power LED, which normally flashes ON once per second to indicate healthy micro-controller operation. After a de-bounce period, the green LED will flash rapidly if the low supply detector is activated.

(2) **Error LED:** The RED error LED will indicate when there is a system error. A flashing RED LED indicates the unit cannot communicate with the transmitter or an adjacent input module, or if the message buffer is full.

(3) **Downstream Receive Data:** This GREEN LED flashes to indicate serial data is being received from a downstream device.

(4) **Downstream Transmit Data:** This RED LED flashes to indicate serial data is being transmitted to a downstream device.

(5) **Upstream Receive Data:** This GREEN LED flashes to indicate serial data is being received from an upstream device.

(6) **Upstream Transmit Data:** This RED LED flashes to indicate serial data is being transmitted to an upstream device.

6 OPERATION

Each input module will send it's input message when triggered, to the downstream unit (connected to the left hand side RJ12 socket). This may be either a transmitter, or another input module. A module connected downstream will acknowledge receipt of a Salcom protocol message, so reliable delivery to the transmitter can be ensured.

The input module may be configured to operate without acknowledging, so that input modules may be connected to a PC or unit that does not support Salcom protocol (but this is not advised, since messages may be lost).

When configured to wait for acknowledgment the input module will attempt to resend the last message again with a frequency as set by the user (up to every 10 seconds – default 1 second).

When a message cannot be acknowledged (probably due to a break in a serial cable link somewhere downstream) the input module may eventually fill its message queue, and stop acknowledging messages from upstream modules. If the input module is in an error or busy state preventing the offloading of messages, the module "breaking" the chain can easily be identified by inspecting the serial traffic and error LEDs.

7 SENDING AN INPUT MODULE MESSAGE

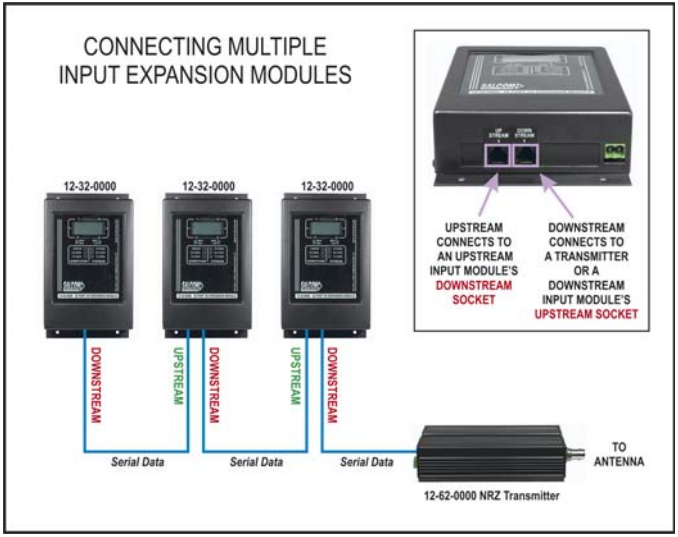
There are three ways of initiating a message sent from the input module:

(1) Using the external discrete inputs
(2) Supply detector threshold
(3) Watchdog

7.1 External Discrete Inputs
An action can be initiated from the 32 external inputs with an input transition to LOW (connection to GND) and/or HIGH (input floating or connection to >+3.5v).

7.2 Low supply message
After a debounce period, the low-supply detector can initiate an action for both "supply going high" and "supply going low"conditions.

7.3 Watchdog
The watchdog feature will initiate an action after a predetermined period. The watchdog also optionally allows the transmission of the current state of selected inputs (including supply level).



System Configuration using multiple Input Modules

8 ERROR CODES

ER2 NOACK	The downstream device failed to acknowledge the last sent message.
ER6 BUSY	12-32 is too busy to process the received message - memory is full.

9 TROUBLE SHOOTING

The following table may help in problem solving where necessary.

Fault	Check
No illumination of Green LED	Bad power supply connection
Input activated but no message sent	PSD configuration incorrect
No RS232 serial communication	Comport connections, baud-rate 9600 no parity, eight data bits, one stop bit
Red LED flashes rapidly	Downstream device not acknowledging - check serial cables and traffic LEDs. Device is busy - memory is full or transmitter unable to clear volume of messges.
Green led flashes rapidly	Low supply detector threshold

10 PROGRAMMING

10.1 Preparations for Connecting the Programming Software

To change the field programmable options, the unit must be connected to a PC running the 12-32 PSD programming software in Windows XP via the standard serial port S1.

Note: To make up a serial cable, the S1 connections are shown on page 2. Alternatively purchase an optional Salcom serial programming cable.

The 12-32 must be powered during programming, +13.8V to power terminals.

Ensure that the 12-32 PSD has the correct com port selected. Once correctly configured perform the following:

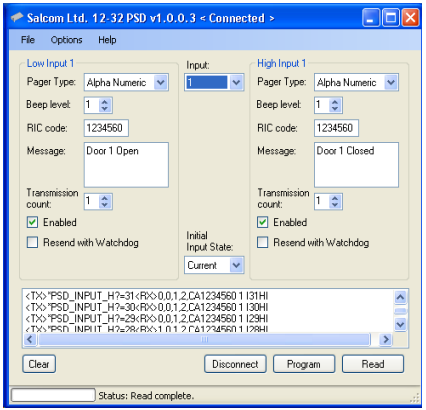
1 Press connect. The status at the bottom of the 12-32 PSD will indicate if successfully connected.
2 Press the read button, or load a PSD configuration file. This will load all settings of the 12-32, which is required before any changes can be programmed. The 12-32 PSD will provide feedback if the user selected operations are successful.

10.2 Using the Programming Software

The 12-32 PSD allows the user to configure the following characteristics:

> Input actions, watchdog and low supply detector settings
> Pre-defined messages
> Configuration of input module ID (which will be added to each message sent).

Once the program is running, the opening screen appears . Use the mouse to select the configuration fields for each feature.



10.3 PSD Input Configuration

All inputs may be configured in a similar fashion, including supply voltage monitoring. The input drop down box provides support for all of the 32 inputs.

The battery input is at the very bottom of the input list. Each input may have a message defined for both a high and low state. Input parameters may be configured as follows:

Pager type: Numeric or Alpha numeric. Tone only pagers are supported by ensuring that the message field is left blank.

Beep Level: Page beep levels 1-4.

RIC Code: Pager ID. Valid Codes are:
0000008 to 2007663
2007672 to 2045055
2045064 to 2097143

0000000 may be used as a "drop" code. This may be used for the watchdog when the watchdog is used, but a watchdog message is to be suppressed.

Message: User message, up to 40 characters in length.

Transmission Count: How many times that message will be sent if triggered.

Enabled: When selected, the configured message will be sent when triggered.

Resend with Watchdog: When the watchdog is enabled, the input message will be sent periodically as configured if in the enabled state.

Initial Input State: Input messages are sent when transitioning to the enabled state.

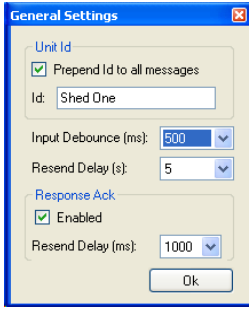
If on start-up "Current" has been selected the current input state is read, so that the input message will not be sent on start-up.

If "High" is selected, the input on startup is assumed to be in the high state, so when found to be low (if this is the case) the transition will result in a message being sent (if enabled).

If "Low", the opposite will occur, the input is assumed to be low on startup, the transition to high resulting in message being transmitted (if enabled, and the input is in the high state).

10.4 PSD General configuration

Selecting *Options->General* will display the general configuration screen as shown overleaf. The following items may be set here.



Unit Id: The Identifying string (up to 10 characters) that may be prepended to each outgoing message. Note that this ID should be numeric if numeric pagers are being used.

Input Debounce: The time delay between the input being triggered and the message being sent.

Resend Delay: When an input has been configured with a transmission count greater than 1, then the resend delay is the delay in seconds before sending the message again.

10.5 PSD Configuration files:

The current 12-32 configuration can be saved using File-Save. Previously saved configuration files can be loaded and edited with, or without a 12-32 connected.

11 SPECIFICATIONS

Power Supply	+11.5 V to 15.2 V nom 13.8 V
Input Current	40 mA approx
Message format	SALCOM proprietary paging protocol
Serial input/output	9600 baud no parity, 8 data bits, 1 stop bit
Discrete inputs	Pulled up to +12v (10K)

SEA AIR & LAND COMMUNICATIONS LTD
PO Box 22-621, 120 St.Asaph Street, Christchurch, New Zealand
Phone: (03) 379-2298 Fax: (03) 365-1580 Email: info@salcom.co.nz
Visit us at www.salcom.co.nz